

Avian Influenza

Surveillance Protocol

Note:

This guidance was prepared in the event of a human infection of highly pathogenic avian influenza H5 infection (e.g., H5N8, H5N2, H5N1, or H7N9). This guidance was revised in context of the 2015 North American epizootic of AH5 in poultry. Please make certain you are working from the current guidance.

Healthcare Provider Responsibilities

1. Consider novel influenza A viruses in the differential diagnosis of influenza-like illness (ILI) and acute respiratory infection (ARI) in persons who have had recent contact (<10 days prior to illness onset) with **sick or dead birds** in any of the following categories:
 - a. Domestic poultry (e.g. chickens, turkeys, ducks)
 - b. Wild aquatic birds (e.g. ducks, geese, swans)
 - c. Captive birds of prey (e.g. falcons) that have had contact with wild aquatic birds
2. Also consider avian influenza in the differential diagnosis of persons with respiratory illness who have come in contact with potentially infected birds through
 - a. Handling / slaughtering / de-feathering / butchering / culling / preparation for consumption
 - b. Direct contact with surfaces contaminated with bird feces or parts (carcasses, organs, etc.)
 - c. Prolonged exposure to birds or poultry in a confined space.
3. Report suspect cases of avian influenza to the local health department immediately.
4. **Airborne isolation precautions, in addition to standard and contact precautions are recommended for all suspected/confirmed cases of avian influenza.**
 - a. Immediately place patient in an airborne infection isolation room. If an AIIR is not available, place a facemask on the patient and isolate him/her in an examination room with the door closed.
 - b. Use gloves, gowns, eye protection (goggles or face shield) and a fit-tested N-95 respirator.
 - c. Current guidance for infection control for persons with novel influenza A viruses associated with severe disease is found at:
<http://www.cdc.gov/flu/avianflu/novel-flu-infection-control.htm>

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Avian Influenza Surveillance Protocol

- d. Immediately notify the infection preventionist when avian influenza is suspected in a health facility. Notify the emergency department and/or infection preventionist when transferring a suspected avian influenza patient to a health facility so the facility can take appropriate precautions.
5. Consult the Division of Infectious Disease Epidemiology (DIDE) (800-423-1271, extension 1) to determine if testing should be done. Testing for avian influenza is free-of charge at the Office of Laboratory Services. Specimen collection should only be done using full airborne, contact and standard precautions.
6. Extensive guidance on the use of antiviral drugs can be found at: <http://www.cdc.gov/flu/avianflu/novel-av-treatment-guidance.htm>. Briefly:
 - a. When clinically indicated, antiviral treatment should be initiated as soon as possible.
 - b. While treatment should ideally be initiated only after obtaining laboratory specimens for confirmation of diagnosis, treatment should not be significantly delayed awaiting collection of laboratory specimens. Treatment should not be delayed pending laboratory results.
 - c. Hospitalized persons and outpatients with severe, complicated or progressive illness should be treated with oral or enterically administered oseltamivir.
 - d. Outpatient cases under investigation who have had recent close contact with a confirmed or probable case of human infection with a novel influenza A virus that can cause severe disease should receive antiviral treatment.
 - e. Outpatients with uncomplicated illness who meet only the travel exposure criteria for a case under investigation are currently not recommended to receive antiviral treatment.
7. Anticipate the need to share information with public health authorities to assist with the investigation of a possible case of avian influenza, including:
 - a. Clinical and laboratory information to confirm the diagnosis;
 - b. Risk factors and exposures; and
 - c. Information on close contacts, including healthcare workers and other patients. Close contacts are defined as persons within 6 feet (2 meters) or within the room or care area of person with confirmed or probable novel influenza A case patient for a prolonged period of time, or with direct contact with infectious secretions while the case patient was likely

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Avian Influenza Surveillance Protocol

to be infectious (beginning 1 day prior to illness onset and continuing until resolution of illness).

Laboratory Responsibilities

1. Refer all requests for testing for avian influenza to DIDE at 800-423-1271, extension 1.
2. Specimens should be obtaining for novel influenza A virus testing as soon as possible after illness onset, ideally within 7 days of illness onset.
3. Standard, contact and airborne precautions are recommended for the collection of respiratory specimens.
4. The following should be collected as soon as possible after illness onset:
 - a. Nasopharyngeal swab, or a nasal aspirate or wash, or two swabs combined in one viral transport media (e.g., nasal or nasopharyngeal swab combined with an oropharyngeal swab). If these specimens cannot be collected, a single nasal or oropharyngeal swab is acceptable.
 - b. For patients with lower respiratory tract illness, a lower respiratory tract specimen (e.g., endotracheal aspirate or bronchoalveolar lavage fluid) can be collected and placed into sterile viral transport media.
 - c. Swab specimens should be collected using swabs with a synthetic tip (e.g., polyester or Dacron®) and an aluminum or plastic shaft. The swab specimen collection vials should contain 1-3 mL of viral transport medium.
 - d. Respiratory specimens should be kept at 4°C for no longer than 3 days. Specimens can alternatively be frozen at $\leq -70^{\circ}\text{C}$.
5. Clinical specimens should be packaged and shipped to OLS according to infectious substance, category B regulations. For information regarding collection and shipping of suspected avian influenza specimens go to: <http://www.wvdhhr.org/labservices/support/shipping.cfm>.

Local Health Responsibilities

1. Educate healthcare providers and laboratories about the responsibilities above. Maintain the capacity to transmit health alerts to local providers when requested to by the state health department.
 2. Seasonal influenza vaccination will not prevent infection with avian influenza A viruses, but can reduce the risk of co-infection with human and avian influenza A viruses. Employees should take the following measures to protect their health
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Avian Influenza Surveillance Protocol

- for case and outbreak investigations that may involve interviews of infectious patients:
- a. Receive seasonal influenza vaccination annually.
 - b. Have personnel fit tested. At a minimum respiratory protection should be at least as protective as a fit-testing NIOSH-certified disposable N95 filtering facepiece respirator.
 - c. Gowns, non-sterile gloves, and face shields or goggles should be available.
3. If a suspect case of avian influenza is reported ensure the following has been done:
- a. **Assure the suspect case has been placed under airborne isolation precautions and contact precautions.**
 - b. Report all suspected cases of avian influenza to DIDE at 304-558-5358, extension 1 or 800-423-1271, extension 1.
 - c. Obtain appropriate laboratory specimens for testing at OLS. See laboratory responsibilities for details.
 - d. Give current treatment guidelines to the provider:
<http://www.cdc.gov/flu/avianflu/novel-av-treatment-guidance.htm>.
 - e. Identify close contacts and initiate prophylaxis ASAP: close contacts are defined as persons within approximately 6 feet (2 meters) or within the room or care area of a confirmed or probable case of novel influenza A for a prolonged period of time, or with direct contact with infectious secretions while the case patient was likely to be infectious (beginning 1 day prior to illness onset and continuing until resolution of illness).
 - i. Highest-risk exposure groups (recognized risk of transmission)
 - Household or close family member contacts of a confirmed or probable case.
 - Administer prophylaxis.
 - ii. Moderate-risk exposure groups (unknown risk of transmission)
 - Healthcare personnel with unprotected close contact with a confirmed or probable case.
 - Consider chemoprophylaxis.
 - iii. Low-risk exposure groups (transmission unlikely)
 - Others who have had social contact of a short duration with a confirmed or probable case in a non-hospital setting (e.g., in a community or workplace environment).

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Avian Influenza Surveillance Protocol

- Chemoprophylaxis is not recommended.
- iv. For guidance on chemoprophylaxis of contacts, see:
<http://www.cdc.gov/flu/avianflu/novel-av-chemoprophylaxis-guidance.htm> Briefly:
 - Begin chemoprophylaxis as soon as possible.
 - Treat with oral oseltamivir or inhaled zanamivir twice daily.
 - Chemoprophylaxis should be continued for 5 days if exposure was time-limited; and 10 days if exposure is ongoing (e.g., household contact).
- 4. Close contacts should be monitored daily for fever and respiratory symptoms for 10 days after the last known exposure to a confirmed or probable case. For instructions on monitoring exposed persons to avian influenza see avian influenza monitoring toolkit at:
<http://www.dhhr.wv.gov/oeps/disease/flu/Pages/default.aspx>.
 - a. Any contact with the following symptoms should be referred for prompt medical evaluation and testing under standard, airborne and contact precautions.
 - i. Fever $\geq 100.4^{\circ}\text{F}$ or;
 - ii. Any new onset of respiratory symptoms (e.g., cough, sore throat, shortness of breath, difficulty breathing).
- 5. Individuals exposed to infected birds with avian influenza should be educated by the local health department and should be monitored for symptoms for 10 days after last exposure. An exposed person is defined as a person with contact in the past 10 days to infected sick or dead birds, or infected flocks. Exposure may include: contact with infected birds (e.g., handling, slaughtering, defeathering, butchering, preparation for consumption); direct contact with surfaces contaminated with feces or bird parts (carcasses, internal organs, etc.); or exposure to sick or dead birds in a confirmed space (e.g. a poultry house). Infected refers to infection with avian influenza A viruses associated with severe human disease or which have the potential to cause severe human disease. An avian influenza monitoring toolkit is available on request at: (304) 558-5358, extension 1; answering service: (304) 925-9946.

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Avian Influenza Surveillance Protocol

State Health Responsibilities

1. Maintain a field response team that is vaccinated with current influenza vaccine; fit-tested or supplied with positive air-purifying respirators and trained to use standard and contact precautions.
2. Maintain capacity to supplement local health response including field response, outbreak investigation and data management.
3. Prompt and complete reporting of avian influenza cases to the CDC through SAM's.
4. Report suspect or confirmed cases of avian influenza to the CDC within 24 hours of notification ("Immediate, Urgent").
5. Provide technical expertise and consultation regarding surveillance, investigation, laboratory confirmation, case contact tracing, control measures and prevention of avian influenza.
6. Maintain situational awareness about avian influenza surveillance, prevention and control among public health partners and the public.
7. Arrange surveillance of all persons being monitored for avian influenza in collaboration with the incident command safety officer and/or the local health department.

Disease Control Objectives

1. If a case of avian influenza is identified, prevent additional cases by:
 - a. Assuring the case has been isolated and airborne isolation precautions, in addition to standard and contact precautions is being followed.
 - b. Identifying close contacts, initiate surveillance and post exposure prophylaxis.

Disease Prevention Objectives

1. Prevent avian influenza through education of agricultural and response workers about appropriate safety measures to prevent exposure
2. Among persons exposed to avian influenza, implement enhanced passive surveillance so that early detection, isolation and treatment can be implemented to prevent further transmission.

Disease Surveillance Objectives

1. To rapidly detect and confirm a case of avian influenza, if it occurs in West Virginia.

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Avian Influenza Surveillance Protocol

2. To rapidly detect and evaluate symptoms in persons exposed to avian influenza.

Public Health Significance

Wild waterfowl are known to be infected, often asymptotically, with the majority of the known subtypes of influenza. This facilitates reassortment of viral genes coding for surface glycoproteins hemagglutinin (HA) and neuraminidase (NA), continually adding to the remarkable diversity of influenza strains circulating in nature. Wild waterfowl maintain the virus in nature through fecal-oral transmission.

Domestic poultry can become infected through contact with infected wild birds. Domestic poultry infections are classified as low pathogenic avian influenza (LPAI) or highly pathogenic avian influenza (HPAI). LPAI may cause no symptoms in infected birds or mild symptoms including 'ruffled feathers' or reduced egg production or respiratory symptoms. In fact, outbreaks of LPAI may be missed without regular testing of flocks. HPAI, by contrast is dramatic with invasion of the respiratory tract and involvement of internal organs with hemorrhage ("chicken Ebola"). Mortality of HPAI can approach 100%.

Influenza viruses have been described as "sloppy, capricious, and promiscuous." These viruses mutate slowly ('genetic drift') or more rapidly with changes in HA and NA subtypes ("genetic shift"). In addition, viruses from different species – humans, swine and birds – can recombine into novel influenza strains. If most people are susceptible to the novel strain and the strain can be efficiently transmitted by person-to-person, a 'pandemic' may result. For example, H1N1 pandemic of 2009 was caused by a recombinant strain with human, swine and avian components.

"Bird flu" or highly pathogenic avian influenza (HPAI) H5N1 was first identified in Guangdong Province, China in 1997 and quietly disappeared. The virus reappeared in 2003 and subsequently spread to Southeast Asia, Indonesia, the Africa, Europe, the Pacific and the Middle East in an unprecedented international epizootic. This strain caused massive die-offs in infected poultry flocks with attendant economic hardships as governments culled birds from involved flocks. Despite initial concerns about an H5N1 pandemic, transmission to humans from infected poultry has been relatively rare, with 826 cases and 440 deaths worldwide between 2003 and March, 2015. Human-to-human transmission, including transmission in healthcare facilities, has been documented only in a few situations with prolonged close contact, and the reproductive

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Avian Influenza

Surveillance Protocol

rate for H5N1 has been estimated at 0.1 to 0.25. Early diagnosis and rapid institution of therapy is associated with better outcomes, so physician and public health awareness is critical.

In March 2013, a novel reassortant avian influenza A H7N9 was identified in 3 Chinese patients who died from severe lower respiratory tract illness. By October 2013, 136 patients had contracted the virus, including 45 (33.1%) patients who died. Pigeons, chickens and ducks in live poultry markets were identified as shedding the virus without clinical evidence of illness. Within a matter of days after closure of live poultry markets in China, there were rapid declines in the numbers of human cases.

In 2015, avian influenza has been identified in the Western and Central United States in wild birds, commercial poultry and backyard flocks. Most common strain is H5N2, followed by H5N8. The United States Department of Agriculture (USDA) Animal and Plant Health Inspection Service (APHIS) maintains a line list of avian influenza findings at: <http://www.aphis.usda.gov/wps/portal/aphis/home/>. These strains originated in Asia during 2014 and crossed into North American wild bird populations where they mixed with North American strains. There have been no human illness from these strains in the US and the risk of illness in humans is thought to be low.

Clinical Description

H5N1 disease begins with fever, cough, and shortness of breath and chest pain. The illness progresses over the course of several days to hypoxia requiring mechanical ventilation. Complications include ARDS, abnormal chest radiograph with consolidation and multi-organ failure. Laboratory findings include elevations of creatinine and liver function tests; and low platelet and white blood cell counts. The illness affects younger persons with a mean (median) age of 19.8 (20) years.

Until recently, H7 and H9 avian influenza viruses were known to rarely causing mild illness in humans. Prior to the 2013 outbreak in China, only one death had been recorded during a large outbreak in the Netherlands involving highly pathogenic A (H7N7).

However, LPAI H7N9 caused severe disease in Chinese patients during the recent 2013 outbreak. Symptoms included fever, fatigue, productive cough, muscle aches, nausea, vomiting and shortness of breath. Onset was sudden, with a median of one day

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Avian Influenza

Surveillance Protocol

between onset and first presentation for medical care. Complications have included fulminant pneumonia, respiratory failure, acute respiratory distress syndrome (ARDS), septic shock, multi-organ failure, rhabdomyolysis and encephalopathy. Cases have generally occurred in older persons with a mean (median) age 60.9 (63) years. Underlying medical illness (diabetes, heart disease, hepatitis, and hypertension) have been present in over half of patients.

Table 1. Clinical Manifestations of Avian Influenza in Poultry and Humans

Virus	Poultry Disease	Human Disease		
		Initial clinical manifestations	Progression and complications	CFR
H7N2 H7N3 H9N2	LPAI	Mild conjunctivitis, ILI	--	--
H7N7	HPAI	Mild conjunctivitis, ILI	--	--
H7N9	LPAI	ILI, fever, cough	Severe pneumonia ARDS Multi-organ failure Rhabdomyolysis Leukopenia, lymphopenia, thrombocytopenia Elevated AST, LDH, CK	33%
H5N1	HPAI	ILI Dyspnea GI symptoms Conjunctivitis Myalgia	Severe pneumonia ARDS Multi-organ failure Leukopenia, lymphopenia, thrombocytopenia Elevated AST, LDH, CK	60%

- ARDS Acute respiratory distress syndrome
- AST Aspartate aminotransferase
- CK Creatine kinase
- CFR Case fatality rate
- GI Gastrointestinal
- HPAI Highly pathogenic avian influenza

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Avian Influenza

Surveillance Protocol

ILI Influenza-like illness
LDH Lactate dehydrogenase
LPAI Low pathogenic avian influenza

Etiologic Agent

Of the three types of influenza viruses (influenza A, influenza B, and influenza C), influenza A is associated with avian influenza. Influenza A viruses are divided into subtypes based on viral surface proteins hemagglutinin (HA) and neuraminidase (NA). There are 18 known HA subtypes and 11 known NA subtypes, meaning that there are 198 different possible combinations of these proteins. All but two known subtypes of influenza A can infect birds (H17N10 and H18N11 have only been found in bats). H1N1 and H3N2 are currently the only two subtypes in general circulation among people.

Reservoir

Wild waterfowl are considered the natural reservoir of avian influenza viruses.

Mode of Transmission

Human infections avian influenza A viruses are transmitted from animals to humans from animals by direct or indirect exposure to infected live or dead poultry or contaminated environments (e.g. live bird markets) Handling sick or dead poultry during the week before onset, slaughtering, defeathering, preparing sick or dead poultry for cooking, and consuming raw or undercooked poultry or poultry products have all been implicated in transmission. Avian influenza A viruses can also be transmitted from animals to humans through an intermediate host, such as a pig.

The spread of avian influenza A viruses through person-to-person transmission has been reported rarely. Almost all cases occurred through unprotected, close, and prolonged contact between a caregiver and a very ill person. Clusters of human infections among family members and household contacts have been reported in Europe and Asia.

Incubation Period

Available data suggest that the estimated incubation period for human infection with H5N1 and H7N9 viruses is generally 3 to 7 days, but has been reported to be as long as 10 days.

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Avian Influenza Surveillance Protocol

Period of Communicability

The infectious period is presumed to begin 1 day prior to onset of symptoms through resolution of illness. Prolonged shedding can occur in children and immunocompromised individuals infected with *seasonal* influenza viruses; this prolonged shedding might also occur with avian influenza.

Outbreak Recognition

One case of avian influenza in a human constitutes an outbreak.

Laboratory Testing

The Office of Laboratory Services offers PCR testing at no cost for influenza. Consult DIDE for testing for avian influenza at 800-423-1271, extension 1.

1. The following should be collected as soon as possible after illness onset:
 - a. Nasopharyngeal swab, or a nasal aspirate or wash, or two swabs combined in one viral transport media (e.g., nasal or nasopharyngeal swab combined with an oropharyngeal swab). If these specimens cannot be collected, a single nasal or oropharyngeal swab is acceptable.
 - b. For patients with lower respiratory tract illness, a lower respiratory tract specimen (e.g., endotracheal aspirate or bronchoalveolar lavage fluid) can be collected and placed into sterile viral transport media.
 - c. Swab specimens should be collected using swabs with a synthetic tip (e.g., polyester or Dacron®) and an aluminum or plastic shaft. The swab specimen collection vials should contain 1-3mL of viral transport medium.
 - d. Respiratory specimens should be kept at 4°C for no longer than 3 days. Specimens can alternatively be frozen at ≤-70°C.
2. Clinical specimens should be packaged and shipped to OLS according to infectious substance, category B regulations. For information regarding collection and shipping of suspected avian influenza specimens go to:
<http://www.wvdhhr.org/labservices/support/shipping.cfm> .

Case Definition AH5

Confirmed Case: Highly pathogenic avian influenza (HPAI) A H5 virus infection in a person that is confirmed by CDC's Influenza Division Laboratory. Presumptive positive

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Avian Influenza

Surveillance Protocol

identification of infection with HPAI A H5 viruses may be made by public health laboratories using the CDC Human Influenza Virus Real-Time RT-PCR Diagnostic Panel for detection of Asian-origin HPAI A/H5 viruses; however, specimens from presumptive positive cases should be sent to CDC for confirmatory testing.

Probable Case: Illness compatible with influenza¹ in a patient meeting any of the exposure criteria below and for whom laboratory test results indicate influenza but do not provide a sufficient level of detail to confirm HPAI A H5 virus infection. Examples of such test results include: results that are presumptive positive for HPAI H5 virus (see Confirmed Case definition above), an influenza real-time reverse transcription polymerase chain reaction (RT-PCR) test that is positive for influenza A but cannot be subtyped (i.e., an influenza RT-PCR test that is positive for influenza A, negative for H1, negative for H1pdm09, and negative for H3); and a rapid influenza diagnostic test (RIDT²) that is positive for influenza A. Specimens from probable cases should be sent to CDC for confirmatory testing.

Case Under Investigation: Illness compatible with influenza¹ in a patient meeting any of the exposure criteria below and for whom laboratory test results are not known or are pending.

Exposure Criteria

- Patients who have had recent contact³ (within <10 days of illness onset) with birds potentially infected with HPAI H5 virus (i.e., sick or dead birds, or flocks where HPAI H5 virus infection has been confirmed).

OR

- Patients who have had recent close contact (within <10 days of illness onset) with confirmed or suspected⁴ cases of human infection with HPAI H5 virus. Close contact may be regarded as coming within about 6 feet (2 meters) of a confirmed or suspected case while the case was ill (beginning 1 day prior to symptom onset and continuing until resolution of illness). This includes healthcare personnel providing care for a confirmed or suspected case, family members of a confirmed or suspected case, persons who lived with or stayed overnight with a confirmed or suspected case, and others who have had similar close physical contact in a community or workplace environment.

OR

- Unprotected exposure to live HPAI A H5 virus in a laboratory.

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Avian Influenza

Surveillance Protocol

Footnotes

¹ Illness compatible with influenza may present as influenza-like illness (ILI) [fever $\geq 100^{\circ}\text{F}$ plus cough or sore throat] or other signs and symptoms associated with influenza such as rhinorrhea, fatigue, myalgia, arthralgia, headache, and difficulty breathing. Note that influenza may not cause fever in all patients (especially in patients under 5 years of age, over 65 years of age, or patients with immune-suppression), and the absence of fever should not supersede clinical judgment when evaluating a patient for illness compatible with influenza. Atypical presentations of influenza may include nausea, vomiting, or diarrhea. While a rare sign of seasonal influenza, conjunctivitis has been reported as a sign of avian influenza virus infection.

² Note that commercially available RIDTs cannot distinguish between influenza A virus subtypes (i.e., they do not differentiate between human and animal influenza A viruses); thus, a positive RIDT test result cannot confirm HPAI A/H5 virus infection. Commercially available RIDTs also may not detect HPAI A/H5 viruses in clinical specimens; therefore a negative RIDT result does not exclude infection with HPAI A/H5 virus.

³ Contact may include: direct contact with birds (e.g., handling, slaughtering, defeathering, butchering, culling, preparation for consumption); or direct contact with surfaces contaminated with feces or bird parts (carcasses, internal organs, etc.); or prolonged exposure to birds in a confined space.

⁴ Suspected cases of HPAI H5 virus infection include probable cases, cases under investigation, and other patients for whom available clinical and epidemiologic information support a diagnosis of infection with HPAI H5 virus.

Case Definition Influenza A (H5N1)

Confirmed Case: Highly pathogenic avian influenza A (H5N1) virus infection in a patient that is confirmed by CDC's Influenza Laboratory or a CDC certified public health laboratory using methods agreed upon by CDC and CSTE. Confirmation of infection with avian influenza A (H5N1) viruses may be made by public health laboratories following CDC-approved protocols for detection of avian influenza A (H5N1) virus, or by laboratories using an FDA-authorized test specific for detection of avian influenza A (H5N1) virus.

Probable Case: Illness compatible with influenza in a patient meeting the exposure criteria below and for whom laboratory diagnostic testing is positive for influenza A,

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Avian Influenza

Surveillance Protocol

negative for H1, negative for H1pdm09, and negative for H3 by real-time reverse transcription polymerase chain reaction (RT-PCR) and therefore unable to be subtyped.

Case Under Investigation: Illness compatible with influenza in a patient meeting any of the exposure criteria below and for whom confirmatory laboratory test results are not known or pending.

Exposure Criteria

- Patients with recent travel (within <10 days of illness onset) to areas where human cases of highly pathogenic avian influenza A (H5N1) virus infection have become infected or to areas where highly pathogenic avian influenza A (H5N1) viruses are known to be circulating in animals.¹

OR

- Patients who have had recent close contact (within <10 days of illness onset) with confirmed or suspected³ cases of human infection with avian influenza A (H5N1) virus. Close contact may be regarded as coming within about 6 feet (2 meters) of a confirmed or suspected case while the case was ill (beginning 1 day prior to illness onset and continuing until resolution of illness). This includes healthcare personnel providing care for a confirmed or suspected case, family members of a confirmed or suspected case, persons who lived with or stayed overnight with a confirmed or suspected case, and others who have had similar close physical contact.²

OR

- Unprotected exposure to live highly pathogenic avian influenza A (H5N1) virus in a laboratory.

¹ [Outbreaks of Highly Pathogenic Avian Influenza \(subtype H5N1\) in poultry notified to the OIE from the end of 2003 to 2 January 2014](#)[143 KB, 1 page] and [Cumulative Number of Confirmed Human Cases for Avian Influenza A\(H5N1\) Reported to WHO, 2003-2013](#)[40 KB, 2 pages].

² Limited non-sustained person-to-person transmission of highly pathogenic avian influenza A (H5N1) virus has been reported in several countries only following close, prolonged unprotected physical contact with a severely ill H5N1 patient.

³ Suspected cases of influenza A (H5N1) virus infection include probable cases, cases under investigation, and other patients for whom available clinical and epidemiologic

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Avian Influenza Surveillance Protocol

information support a diagnosis of infection with highly pathogenic avian influenza A (H5N1) virus.

Case Definition Influenza A (H7N9)

Confirmed Case: Avian influenza A (H7N9) virus infection in a patient that is confirmed by CDC's Influenza Laboratory or a CDC certified public health laboratory using methods agreed upon by CDC and CSTE. Confirmation of avian influenza A (H7N9) virus infections may be made by public health laboratories following CDC-approved protocols for detection of avian influenza A (H7N9) virus, or by laboratories using an FDA-authorized test specific for detection of avian influenza A (H7N9) virus.

Probable Case: Illness compatible with influenza in a patient meeting any of the exposure criteria below and for whom laboratory diagnostic testing is positive for influenza A, negative for H1, negative for H1pdm09, and negative for H3 by real-time reverse transcription polymerase chain reaction (RT-PCR) and therefore unable to be subtyped.

Case Under Investigation: Illness compatible with influenza in a patient meeting any of the exposure criteria below and for whom confirmatory laboratory test results are not known or pending.

- Patients with recent travel (within <10 days of illness onset) to areas where human cases of avian influenza A (H7N9) virus infection have become infected or to areas where avian influenza A (H7N9) viruses are known to be circulating in animals (poultry).¹

OR

- Patients who have had recent close contact (within <10 days of illness onset) with confirmed or suspected³ cases of human infection with avian influenza A (H7N9) virus. Close contact may be regarded as coming within about 6 feet (2 meters) of a confirmed or suspected case while the case was ill (beginning 1 day prior to illness onset and continuing until resolution of illness). This includes healthcare personnel providing care for a confirmed case, family members of a confirmed case, persons who lived with or stayed overnight with a confirmed or suspected case, and others who have had similar close physical contact.²

OR

- Unprotected exposure to live avian influenza A (H7N9) virus in a laboratory.
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Avian Influenza Surveillance Protocol

¹ As of January 10, 2014, China was the only country where avian influenza A (H7N9) viruses were known to be circulating in animals (poultry) or where human cases have become infected. For more information, including updates on countries affected, please see the CDC [Avian Influenza A \(H7N9\) Virus](http://www.cdc.gov/flu/avianflu/h7n9-virus.htm)(<http://www.cdc.gov/flu/avianflu/h7n9-virus.htm>) information page.

² Limited data are available for avian influenza A (H7N9) virus in which limited non-sustained person-to-person transmission could not be excluded in some family clusters; limited non-sustained person-to-person transmission of highly pathogenic avian influenza A (H5N1) virus has been reported in several countries following close, prolonged unprotected contact with a severely ill H5N1 patient, including in household and hospital settings.

³ Suspected cases of avian influenza A (H7N9) virus infection include probable cases, cases under investigation, and other patients for whom available clinical and epidemiologic information support a diagnosis of infection with avian influenza A (H7N9) virus.

Preventive Interventions

1. The best way to prevent an infection with avian influenza A viruses is to avoid exposure.
 - a. People should avoid wild birds and observe them only from a distance.
 - b. Avoid contact with domestic birds (poultry) that appear ill or have died.
 - c. Avoid contact with surfaces contaminated with feces from wild or domestic birds.
2. Those at highest risk for avian influenza infection are those people who work with poultry or respond to avian influenza outbreaks.
 - a. Follow recommended biosecurity and infection control practices including the appropriate use of personal protective equipment and pay careful attention to hand hygiene. Recommendations for worker protection and use of personal protective equipment can be found at: <http://www.cdc.gov/flu/avianflu/h5/worker-protection-ppe.htm>.
 - b. Poultry outbreak responders should receive seasonal influenza vaccination and take prophylactic antiviral medication during response.
 - c. Responders should be monitored for illness during and after responding to outbreaks among poultry.

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3. The United States poultry industry maintains rigorous health and safety standards including routine monitoring for avian influenza.
 - a. Individuals are reminded to handle raw poultry hygienically and cook all poultry and poultry products (including eggs) thoroughly before eating. Proper cooking kills influenza viruses.
4. If traveling to a state/country with avian influenza A outbreaks in poultry or people individuals should observe the following:
 - a. Avoid visiting poultry farms, bird markets and other places where live poultry are raised, kept, or sold.
 - b. Avoid preparing or eating raw or undercooked poultry products.
 - c. Practice hygiene and cleanliness.
 - d. Seek medical care if you become sick during or after travel.

Treatment

CDC currently recommends treatment with oseltamivir, peramivir, or zanamivir. Careful monitoring for antiviral resistance is important; however. Resistance has been reported in some H5N1 viruses and some H7N9 viruses from human cases.

Detailed treatment guidelines can be found at: <http://www.cdc.gov/flu/avianflu/novel-av-treatment-guidance.htm>

Surveillance Indicators

- See outbreak protocol (a single case of avian influenza is defined as an outbreak).

References

Aditama, T. Y., et al. (2012). "Avian influenza H5N1 transmission in households, Indonesia." PLoS One **7**(1): e29971.

Gong, Z., et al. (2014). "Epidemiology of the avian influenza A (H7N9) outbreak in Zhejiang Province, China." BMC Infect Dis **14**: 244.

Kudo, K., et al. (2012). "Clinical preparedness for severe pneumonia with highly pathogenic avian influenza A (H5N1): experiences with cases in Vietnam." Respir Investig **50**(4): 140-150.

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Liu, Q., et al. (2014). "Major emerging and re-emerging zoonoses in China: a matter of global health and socioeconomic development for 1.3 billion." Int J Infect Dis **25**: 65-72.

Liu, Q., et al. (2013). "Characteristics of human infection with avian influenza viruses and development of new antiviral agents." Acta Pharmacol Sin **34**(10): 1257-1269.

Poovorawan, Y., et al. (2013). "Global alert to avian influenza virus infection: from H5N1 to H7N9." Pathog Glob Health **107**(5): 217-223.

Tang, R. B. and H. L. Chen (2013). "An overview of the recent outbreaks of the avian-origin influenza A (H7N9) virus in the human." J Chin Med Assoc **76**(5): 245-248.

USDA, "Avian Influenza Disease," 2015; Accessed at:

http://www.aphis.usda.gov/wps/portal/aphis/home!/ut/p/a1/04_Sj9CPyksy0xPLMnMz0vMAfGjzOK9_D2MDJ0MjDz9vT3NDDz9woIMnDxcDA2CjYEKIoEKDHAARwNC-sP1o8BKnN0dPUzMfYB6TCyMDDxdgPLmlr4GBp5mUAV4rCjIjTDIdFRUBADp5_IR/?1dmy&urile=wcm%3apath%3a%2Faphis_content_library%2Fsa_our_focus%2Fsa_animal_health%2Fsa_animal_disease_information%2Fsa_avian_health%2Fct_avian_influenza_disease on April 14, 2015

WHO, "Avian influenza: assessing the pandemic threat," 2005; Accessed at:

http://whqlibdoc.who.int/hq/2005/WHO_CDS_2005.29.pdf on April 15, 2015.

WHO "Guidelines for prevention and control of human cases of avian influenza disease (bird flu)" 2008; Accessed at:

http://www.nih.org.pk/files/Guidelines/Guidelines%20Avian%20Influenza%20Bird%20Flu_%202008.pdf on May 27, 2015.

H5 N1 Case Definitions

<http://www.cdc.gov/flu/avianflu/h5n1/case-definitions.htm>

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